25X1

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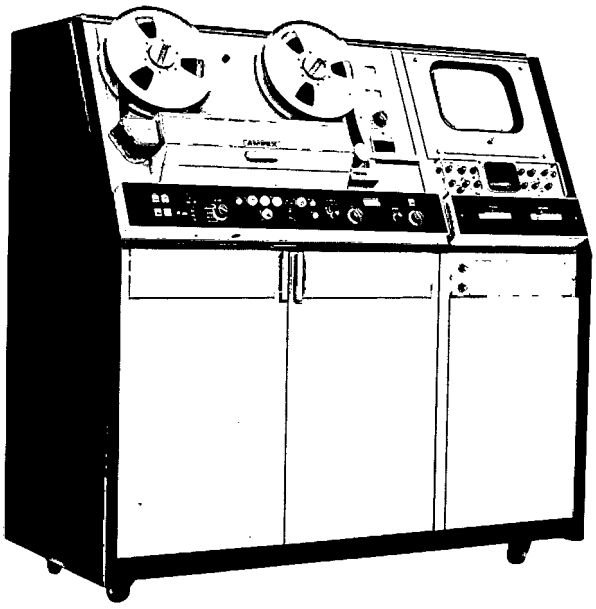
VR 2000 - 7 month delivery w/ accessories 1+2 -
SSM Device - 1 yr delivery.
Photo record monitor
Visual monitor.

AMPEX

80K

# VR-2000 Teleproduction Videotape Recorder

CONRAC
CWA 10N
Photo Scope



**The only major advancement in television recording since the introduction of the original Ampex Videotape Recorder in 1956.**

25X1

*The VR-2000 produces multi-generation color and monochrome dupes, production flexibility so superior that it has been called "the turning point in television tape production"!*

The Ampex VR-2000 Videotape Recorder is more than an "improvement" over earlier designs; it is a totally new recorder, the result of a total evaluation of all available components, every technology involved, an evaluation of even the recording method and bandwidth. The result is a new standard of picture quality unmatched by any other television recorder in the world. The VR-2000 is being used by major networks in the U.S. for color recording and mastering . . . and by other networks throughout the world. With totally new electronic circuitry the K-Factor rating of the VR-2000 has been reduced to 1%. With the new high-band signal system, you can obtain color copies that compare with the original, monochrome dupes to the third generation . . . all with the quality of the master.

## A New Standard

The traditional standards of bandwidth, signal-to-noise, and time base stability are inadequate for advanced teleproduction work or extensive duplication. Slight "improvements" have been suggested, but they are only half measures. The VR-2000 represents a totally *new* standard of performance. Extended bandwidth providing more room for color and an adequate guard band, dramatically increased signal-to-noise ratio, greatly improved time base stability.

## The K-Factor Performance

The K-Factor measurement technique has been widely used in Europe and Australia for a number of years. Briefly, it is a measurement of a recorder's over-all performance in terms of transient response, and is expressed as a percentage. A theoretically perfect system would have a K-Factor of zero percent. Prior to the VR-2000, the best recorders could manage a K-Factor rating of about 5%. The VR-2000 has a K-Factor rating of 1%!

## Total Teleproduction Capability

The picture quality put on tape by the VR-2000 is so high that color copies and monochrome copies to several generations can be made, all with master-like quality. To this add the entire range of Ampex editing equipment and accessories, the time-saving, built-in test instrumentation, the 99% transistorization, and you have a recorder that's unmatched by anything else, anywhere. This is your big competitive edge . . . it's the final step toward the full realization of tape as a total teleproduction medium!

## Compatability With Other Recorders

Though the VR-2000 is a high-band recorder, it is fully compatible with all existing low-band machines using the transverse-scan, four-head technique. Further, the VR-2000 operates on all of the world's popular line and bandwidth standards, in color and monochrome. One of two preselected standards may be selected by a pushbutton on the control panel.

## Features

**Totally new, in concept and production · K-Factor of 1% · Improved signal-to-noise ratio of 46 db or better · New high-band signal system · Retractable erase head reduces tape-wear · Intersync* for synchronous operation · Built-in test instrumentation · 99% solid state (nuvistors or tubes are used where such use contributes to the high performance delivered by the VR-2000) · Fully compatible with other transverse-scan, four-headed recorders · Operates on 405, 525 and 625 line standards · Simple to operate, yet an "engineer's recorder" · Utilizes the full range of Ampex accessories for total teleproduction capability · Prestige and profit building potential through superior quality, reliability and flexibility.**

## Accessories

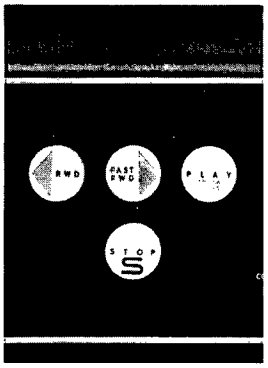
1 **AMTEC* System:** Time Element Compensator for perfect picture geometry.

2 **COLORTEC* System:** For faithful color recovery of both masters and dubs.

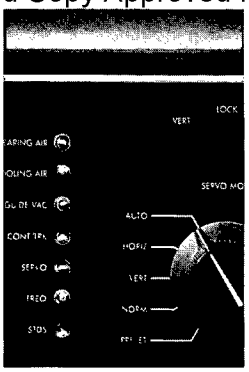
3 **ELECTRONIC EDITOR:** For fast, accurate electronic splicing. Insert substitute scenes at will, or assemble programs scene-by-scene.

4 **EDITEC* System:** The final step in electronic editing, a programmer for the electronic editor. Accurate to the single frame, provides even for animation directly on tape.

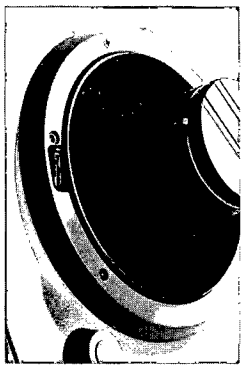
**Complete systems for closed circuit and broadcast television**



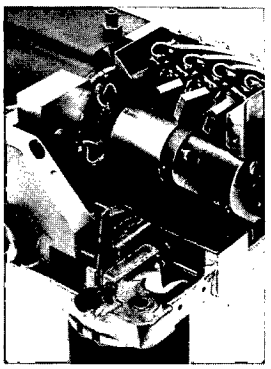

**Operating convenience . . .** assured by the functional grouping of all operating controls.



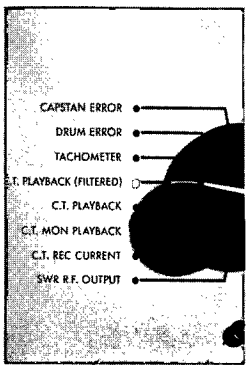

**Full protection . . .** afforded by tally lights and a host of protection features.



**Accidental erasure prevented . . .** a Teflon ring may be placed under the program reel, activating a microswitch and locking out all erase and record functions.



**All new Mk IV video head . . .** designed from the ground up, with integral video preamps, noise-free rotary transformers, air-bearing heads.




**Full monitoring . . .** switchable A-scope checks all important circuits; laboratory scope can be connected to the same circuits.

# Specifications

## Physical Characteristics

*Dimensions*
Height, 63" (160 cm); width, 65" (165 cm); depth, 31" (78.7 cm).
Weight, 1300 lbs. maximum.

*Temperature and Humidity*
**Temperature:** 0°C to 55°C (tape limited).
**Relative Humidity:** 10% to 90%.

*Power Requirements*
**Input Power:** 117 volts ±10%, tapped for 105-115-125 volts, 60 cycle, 30 amps. (Will regulate and operate without changing taps from 105-125 volts.)
OR —
230 volts ±5%, tapped for 210-220-230-240-250 volts, 50 cycle, 15 amps.
**Convenience Outlet:** 4 outlets fused for 16A total.

*Signal Requirements*
**Video Composite Signal:** 0.5 to 1.5 volts peak-to-peak composite, sync negative, EIA-FCC standard or 405, 625 line standards (819 on custom order), 75 ohm unbalanced.
**Sync Input:** 75 ohms, 2 to 8 volt, peak-to-peak.

*Audio Input*
**Program Line:** High impedance balanced bridge for 500/600 ohm line at —10 dbm level (minimum); or high impedance unbalanced (15K).
**Cue Line:** High impedance balanced bridge (15K) at —10 dbm (minimum). Built-in crystal microphone.

## Operating Characteristics

*Tape Speed*
7½ or 15 ips as selected by front panel switch.

*Recording Time*
96 minutes on 14" (35.6 cm) 7200' reel of tape at 15 ips (38 cm/sec).
192 minutes on 14" (35.6 cm) 7200' reel of tape at 7½ ips (19 cm/sec).
Normally supplied for operation with 12" (30.5 cm) reels.

*Picture and Sound Separation*
18½ frame, sound leads, at 15 ips.
37 frame, sound leads, at 7½ ips.

*Stability*
**Jitter** (i.e., disturbance rates greater than 1 cps): ±0.075 μs.
**Drift** (i.e., disturbance rates less than 1 cps): ±0.1 μs.
**Geometric:** Less than ±0.15 μs during replay of a recording on the tracks selected to produce maximum error.

*Standards*
Two preset deviation, pre-emphasis, and scanning standards may be selected by means of a two-position switch, the preset standards are determined by three plug-in circuit modules, one set of three for the desired combination of modulation level, pre-emphasis, or scanning standards.
**Standards available:** 4.28 Mc — 5.0 Mc — 6.8 Mc Dev., Monochrome Pre-emphasis, 525 line, Low Band.
5.5 Mc — 5.79 Mc — 6.5 Mc Dev., Color Pre-emphasis, 525 line, Color.
5.0 Mc — 5.54 Mc — 6.8 Mc Dev., CCIR Monochrome Pre-emphasis, 625 line, Low Band.
7.16 Mc — 7.8 Mc — 9.3 Mc Dev., Mono/Color Pre-emphasis, 625 line, High Band.
4.28 Mc — 5.0 Mc — 6.8 Mc Dev., Monochrome Pre-emphasis, 405/525 line, Low Band.
7.06 Mc — 7.9 Mc — 10.0 Mc Dev., Mono/Color Pre-emphasis, 525 line, High Band.

*Monitoring Facilities*
**Video:** A Conrac CMC14/R 14" (35.6 cm) video monitor and a Tektronix RM529 waveform monitor are provided.
**Audio and Cue:** 3-watt audio amplifier has frequency response, 40 cycles to 20 kilocycles. Six-position switch monitors Line In, Line Out, Cue In, Cue Out, Instant Audio, and Spare.
**System:** A built-in "A" Scope provides monitoring of the following:
Control Track Playback (Normal Head), Control Track Playback (Simultaneous Monitor Head), Expanded Control Track Playback (Simultaneous Monitor Head), Switcher R-F Output, Drum Tachometer Signal Input to Servo, Drum Error, Capstan Error, Amtec* Error, Colortec* Error, Drum Oscillator for Setting Frequency, Capstan Oscillator for Setting Frequency, Record Control Track Current, Chroma Level, Spares.

## Response Characteristics

| *Video* | *525/60 Low Band* | *525/60 High Band* |
|---|---|---|
| **MONOCHROME** | | |
| **Bandwidth:** | Flat to 3.8 Mc; —3 db at 4.2 Mc. Tolerance ± 1 db | Flat to 4.1 Mc; —3 db at 4.5 Mc. Tolerance ±0.5 db |
| **Signal-to-Noise Ratio:** | 45 db peak-to-peak video to rms noise on interchange basis (Monochrome) | 46 db peak-to-peak video to rms noise on interchange basis (Monochrome and Color) |
| **Transient Response:** (Utilizing 2T sine² pulse) | Maximum K-Factor 2% | Maximum K-Factor 1% |
| **Low Frequency Linearity:** | 2% Blanking to White (maximum) | 2% Blanking to White (maximum) |
| **Rise Time:** (.02 μsec or less rise time on input pulse) | 0.12 μ/sec maximum | 0.11 μ/sec maximum |
| **COLOR** | | |
| **Signal-to-Noise Ratio:** | 40 db peak-to-peak video to rms noise on interchange basis | 46 db peak-to-peak video to rms noise on interchange basis |
| **Differential Gain:** | Less than 4% Blanking to White | Less than 4% Blanking to White |
| **Differential Phase:** | Less than 4° at 3.58 Mc off tape | Less than 4° at 3.58 Mc off tape |
| **Maximum Color Phase Error:** due to Differential Phase, 75% Color Bars, 3.58 Mc Subcarrier | 2° maximum | 2° maximum |
| **Moire:** (Color bars 75% modulation, 3.58 Mc) | —24 db minimum | —40 db minimum |

| *Video (International)* | *625/50 Low Band* | *625/50 High Band* |
|---|---|---|
| **MONOCHROME** | | |
| **Bandwidth:** | Flat to 4.5 Mc; —3 db at 5.0 Mc. Tolerance ±1 db | Flat to 5.5 Mc; —3 db at 6.0 Mc. Tolerance ±0.5 db |
| **Signal-to-Noise Ratio:** | 42 db peak-to-peak video to rms noise on interchange basis (Monochrome) | 43 db peak-to-peak video to rms noise on interchange basis (Monochrome and Color) |
| **Transient Response:** (Utilizing 2T sine² pulse) | Maximum K-Factor 2% | Maximum K-Factor 1% |
| **Low Frequency Linearity:** | 2% Blanking to White (maximum) | 2% Blanking to White (maximum) |
| **Rise Time:** (0.02 μsec or less rise time on input pulse) | 0.10 μ/sec maximum | 0.08 μ/sec maximum |
| **COLOR** | | |
| **Signal-to-Noise Ratio:** | ——— | 43 db peak-to-peak video to rms noise on interchange basis |
| **Differential Gain:** | ——— | Less than 4% Blanking to White |
| **Differential Phase:** | ——— | Less than 4° at 4.43 Mc off tape |
| **Maximum Color Phase Error:** due to Differential Phase, 75% Color Bars, 4.43 Mc Subcarrier | ——— | 2° maximum |
| **Moire:** (Color Bars 75% modulation, 4.43 Mc Subcarrier) | ——— | —30 db minimum |

*Audio*
**Bandwidth:** ±2 db, 50 cps to 12 Kc at 15 ips
±2 db, 50 cps to 10 Kc at 7½ ips
**Signal-to-Noise Ratio:** 53 db below 3% distortion at 400 cps
**Flutter and Wow:** 0.15% rms at 7½ ips, 0.10% rms at 15 ips measuring components from 0.6 to 250 cps

*Cue Track*
**Bandwidth:** ±3 db, 60 cps to 8 Kc at 15 ips
±3 db, 60 cps to 6 Kc at 7½ ips
NOTE: Response has a 20 db notch at 240 cycles on 60 cycle systems; 20 db notch at 250 cycles on 50 cycle systems.
**Flutter and Wow:** Same as audio channel.

These specifications supersede all previous specifications, stated or implied. Term financing and leasing available on all equipment and systems.

**AMPEX** **AMPEX CORPORATION**
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